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## *Correction* to Paper "On the Systematic Errors of the Greenwich North Polar Distances," *Memoirs*, vol. xlv. p. 156.

The Flexure correction for 1851 and 1852 in the table should be $+0''{\cdot}73$ instead of $+0''{\cdot}50$. The value adopted is not stated in the "Introductions" to the *Greenwich Observations*, and it was assumed to have been the same as for 1853; but on referring to the original records it appears that the value $+0''{\cdot}73$ was used, being the mean of the determinations in December 1850 and February 1851, giving double weight to the latter.

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## *Spectroscopic Results for the Motions of Stars in the Line of Sight, obtained at the Royal Observatory, Greenwich, IV.*

(*Communicated by the Astronomer Royal.*)

The results for star motions here given are in continuation of those printed in the *Monthly Notices*, vol. xxxvi. p. 318, vol. xxxvii. p. 22, and vol. xxxviii. p. 493. The observations were made with the "half-prism" spectroscope, one "half-prism" giving a dispersion of about 18½° from A to H being used, except in a few cases of bright stars mentioned in the remarks, where a train of two "half-prisms," with a dispersion of 83° from A to H, was used. These dispersions have been inferred by measurement of the distance between $b_1$ and $b_4$ as compared with the wave-length measure. An eyepiece with a magnifying power of 14 was used. In some of the recent observations, since 1880 March, the pointer in the micrometer was coated with Balmain's luminous paint, forming a bright line with which the star-line and comparison line were respectively bisected. In other cases the field was illuminated by a luminous-painted diaphragm placed in the micrometer adapter. This phosphorescent illumination was found to be much superior to artificial light.

### *Motions of Stars in the Line of Sight in Miles per Second, observed with the Half-Prism Spectroscope.*

(+ denotes Recession; − Approach.)

The initials W. C. and M. are those of Mr. Christie and Mr. Maunder respectively.

The weights are on a scale of ½ to 5 for each observation.

| Date. | Observer. | Weight. | Line. | Earth's motion in miles per sec. | Concluded motion of star. Measured. | Estd. | Remarks. |
|---|---|---|---|---|---|---|---|
| | | | | *α Andromedæ.* | | | |
| 1879, Sept. 3 | M. | 6 | F | − 8·5 | −13·6 | −20·5 | |
| 1880, Nov. 8 | M. | 6 | F | + 9·5 | −37·0 | −35·4 | Misty. Spectrum steady though faint. |

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| Date. | | Obser-ver. | Weight. | Line. | Earth's motion in miles per sec. | Concluded motion of star. Measured. | Estd. | Remarks. |
|---|---|---|---|---|---|---|---|---|
| | | | | *β Cassiopeiæ.* | | | | |
| 1880, Oct. | 1 | M. | 7 | F | − 4·7 | + 32·4 | + 40·9 | Spectrum steady though faint. |
| | | | | *γ Pegasi.* | | | | |
| 1879, Sept. | 3 | M. | 4 | F | − 7·8 | − 8·1 | − 7·8 | |
| 1880, Nov. | 17 | W.C. | 2 | F | + 13·8 | − 28·6 | − 20·7 | |
| | 27 | M. | 12 | F | + 15·7 | − 61·6 | − 63·5 | |
| | | | | *α Cassiopeiæ.* | | | | |
| 1880, Feb. | 21 | M. | 5 | $b_1$ | + 11·5 | − 0·4 | + 1·9 | Interrupted by cloud. |
| Nov. | 20 | M. | 4 | $b_1$ | + 5·0 | + 37·1 | + 42·7 | |
| | | | | *γ Cassiopeiæ.* | | | | |
| 1880, Oct. | 1 | M. | 9 | F | − 6·6 | − 18·2 | − 23·0 | Steady. Definition good. |
| Nov. | 21 | W.C. | 3 | F | + 3·8 | − 55·3 | − 35·9 | Definition bad. |
| | | | | *β Andromedæ.* | | | | |
| 1878, Nov. | 2 | M. | 9 | $b_1$ | + 3·4 | + 9·6 | + 17·8 | Definition good. |
| 1880, Sept. | 29 | M. | 9 | $b_1$ | − 6·0 | + 9·3 | + 8·9 | Definition fair. |
| | | | | *β Arietis.* | | | | |
| 1879, Sept. | 3 | M. | 5 | F | − 17·7 | − 10·6 | − 12·5 | Near the Moon. Faint. |
| 1880, Nov. | 17 | W.C. | 6 | F | − 7·9 | − 20·1 | − 12·1 | |
| | | | | *α Piscium.* | | | | |
| 1880, Nov. | 17 | W.C. | 1½ | F | + 8·7 | − 24·8 | − 31·6 | |
| | 27 | M. | 6 | F | + 11·5 | − 33·2 | − 43·4 | Faint. Definition poor. |
| | | | | *$\gamma^1$ Andromedæ.* | | | | |
| 1878, Nov. | 2 | M. | 4 | $b_1$ | − 0·6 | + 3·9 | + 8·7 | Definition good. |
| 1880, Feb. | 21 | M. | 6 | $b_1$ | + 15·5 | − 34·4 | − 31·4 | Definition fair. |
| | | | | *α Arietis.* | | | | |
| 1878, Sept. | 18 | M. | 3 | $b_1$ | − 11·5 | − 18·1 | − 14·5 | Definition poor. |
| Oct. | 22 | M. | 4 | $b_1$ | − 2·1 | − 16·2 | − 22·1 | Definition fair. |
| Nov. | 2 | M. | 1 | $b_1$ | + 1·4 | − 1·7 | − 1·4 | Two-prism train. |
| 1880, Nov. | 20 | M. | 3 | $b_1$ | + 7·3 | − 32·8 | − 33·8 | |

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| Date. | Observer. | Weight. | Line. | Earth's motion in miles per sec. | Concluded motion of star. Measured. | Estd. | Remarks. |
|---|---|---|---|---|---|---|---|
| | | | | *α Ceti.* | | | |
| 1878, Oct. 22 | M. | 2 | $b_1$ | − 4·1 | −27·5 | −30·4 | Definition poor. |
| 22 | M. | 2 | $b_1$ | − 4·1 | −33·5 | −43·1 | $b_4$ not clearly isolated. |
| | | | | *β Persei.* | | | |
| 1880, Nov. 17 | W.C. | 3 | F | + 0·5 | −24·1 | −29·5 | |
| | | | | *α Persei.* | | | |
| 1880, Nov. 8 | M. | 6 | F | − 3·8 | +26·2 | +26·5 | Misty. Steady but faint. |
| 28 | W.C. | 1 | F | + 1·9 | +11·7 | +15·3 | Sky hazy. |
| | | | | *ζ Persei.* | | | |
| 1880, Feb. 17 | M. | 1 | $b_1$ | +13·4 | −40·4 | −49·5 | Star-lines faint. |
| | | | | *Aldebaran.* | | | |
| 1880, Jan. 26 | M. | 4 | $b_1$ | +16·0 | +22·4 | +22·9 | Definition very poor. |
| | | | | *Capella.* | | | |
| 1880, Jan. 26 | M. | 6 | $b_1$ | +12·6 | +17·7 | +19·5 | Definition poor. |
| | | | | *Rigel.* | | | |
| 1880, Jan. 30 | M. | 6 | F | +13·3 | +13·2 | + 7·3 | Very tremulous. Direct comparison. |
| Mar. 13 | M. | 4 | F | +15·7 | +13·4 | +12·8 | |
| | | | | *γ Orionis.* | | | |
| 1880, Jan. 30 | M. | 8 | F | +14·1 | − 1·1 | + 0·3 | |
| Mar. 17 | M. | 2 | F | +17·5 | − 5·7 | − 7·1 | Definition poor. |
| | | | | *β Tauri.* | | | |
| 1880, Jan. 30 | M. | 6 | F | +14·3 | − 8·7 | − 9·7 | Definition fair. |
| Mar. 15 | M. | 8 | F | +18·5 | −27·1 | −29·1 | Definition good. |
| | | | | *δ Orionis.* | | | |
| 1880, Jan. 30 | M. | 2 | F | +13·2 | − 2·0 | − 0·8 | Definition poor. |
| Mar. 13 | M. | 3 | F | +17·0 | −18·1 | −15·7 | Definition variable. |
| | | | | *ε Orionis.* | | | |
| 1880, Jan. 30 | M. | 6 | F | +12·9 | −37·6 | −36·9 | Definition fair. |
| Mar. 17 | M. | 4 | F | +16·8 | −31·9 | −27·6 | Spectrum tremulous. |

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| Date. | Obser-ver. | Weight. | Line. | Earth's motion in miles per sec. | Concluded motion of star. | | Remarks. |
|---|---|---|---|---|---|---|---|
| | | | | | Measured. | Estd. | |
| *ζ Orionis.* | | | | | | | |
| 1880, Jan. 30 | M. | 3 | F | +12·6 | + 7·3 | + 4·6 | Definition poor. |
| Mar. 17 | M. | 2 | F | +16·7 | − 0·3 | − 0·9 | Definition poor. |
| *κ Orionis.* | | | | | | | |
| 1880, Jan. 30 | M. | 2 | F | +11·4 | + 4·2 | + 3·6 | Spectrum very tremulous. |
| Mar. 13 | M. | 2 | F | +15·6 | − 6·8 | − 5·3 | Spectrum very tremulous. |
| *α Orionis.* | | | | | | | |
| 1880, Jan. 26 | M. | 4 | $b_1$ | +11·5 | +24·6 | +20·6 | Definition poor. |
| *β Aurigæ.* | | | | | | | |
| 1880, Mar. 13 | M. | 2 | F | +17·2 | −11·1 | − 9·5 | Definition fair. |
| Apr. 8 | M. | 8 | F | +15·9 | −12·1 | −11·6 | Definition very good. |
| *γ Geminorum.* | | | | | | | |
| 1880, Feb. 10 | M. | 1 | F | +13·0 | +18·8 | +23·8 | Observation unsatisfactory. |
| Mar. 15 | M. | 8 | F | +18·1 | − 2·8 | + 1·3 | Definition good. Steady. |
| *Sirius.* | | | | | | | |
| 1880, Jan. 30 | M. | 8 | F | + 6·9 | +28·2 | +30·0 | Definition poor. |
| 30 | M. | 12 | F | + 6·9 | +27·0 | +22·6 | Two-prism train. |
| Mar. 19 | M. | 8 | F | +13·9 | + 1·3 | + 5·8 | Two-prism train. |
| 24 | M. | 9 | F | +14·1 | + 1·6 | + 6·1 | Two-prism train. |
| *β Canis Minoris.* | | | | | | | |
| 1880, Mar. 17 | M. | 3 | F | +16·6 | −14·4 | −14·6 | |
| *Castor.* | | | | | | | |
| 1880, Mar. 24 | M. | 4 | F | +17·6 | 0·0 | − 1·0 | Two-prism train. |
| *Procyon.* | | | | | | | |
| 1880, Mar. 19 | M. | 8 | F | +16·2 | + 3·0 | + 8·0 | Two-prism train. |
| 24 | M. | 10 | F | +16·7 | + 7·1 | + 6·0 | Two-prism train. |
| *Pollux.* | | | | | | | |
| 1880, Jan. | | | | + 4·5 | −39·5 | −43·1 | Definition poor. |

| Date. | | Obser-ver. | Weight. | Line. | Earth's motion in miles per sec. | Concluded motion of star. Measured. | Estd. | Remarks. |
|---|---|---|---|---|---|---|---|---|
| | | | | | | *α Hydræ.* | | |
| 1880, Feb. | 21 | M. | 3 | $b_1$ | + 2·2 | +35·6 | +36·7 | |
| | | | | | | *ε Leonis.* | | |
| 1880, Feb. | 17 | M. | 2 | $b_1$ | + 3·1 | − 5·1 | − 3·1 | |
| | 21 | M. | 3 | $b_1$ | + 4·4 | − 1·1 | − 0·9 | |
| | | | | | | *Regulus.* | | |
| 1880, Mar. | 17 | M. | 7 | F | + 9·1 | −17·5 | +15·6 | Definition fair. |
| | | | | | | *$\gamma^1$ Leonis.* | | |
| 1880, Feb. | 17 | M. | 3 | $b_1$ | +10·3 | −43·3 | −40·2 | Definition poor. |
| | | | | | | *β Ursæ Majoris.* | | |
| 1879, May | 21 | M. | 2 | F | +12·3 | +18·3 | + 5·2 | Definition bad. |
| June | 9 | M. | 5 | F | +10·8 | +49·2 | +49·1 | |
| 1880, Apr. | 8 | M. | 4 | F | +11·4 | 0·0 | + 3·5 | Definition fair. |
| May | 22 | M. | 2 | F | +12·2 | +12·9 | +11·7 | Definition poor. |
| | | | | | | *α Ursæ Majoris.* | | |
| 1880, Feb. | 21 | M. | 2 | $b_1$ | + 4·0 | − 4·0 | − 4·0 | Definition bad. Very tremulous. |
| | | | | | | *δ Leonis.* | | |
| 1880. Mar. | 17 | M. | 8 | F | + 5·6 | −38·4 | −36·2 | Definition good. |
| May | 15 | M. | 6 | F | +16·9 | −15·1 | −14·0 | Definition fair. |
| | | | | | | *θ Leonis.* | | |
| 1880, Mar. | 17 | M. | 2 | F | + 5·0 | +13·0 | + 9·3 | Definition good. |
| | | | | | | *χ Ursæ Majoris.* | | |
| 1879, May | 21 | M. | 1 | F | +13·4 | +25·8 | +43·6 | Very tremulous. Doubtful. |
| | | | | | | *β Leonis.* | | |
| 1880, Mar. | 17 | M. | 4 | F | + 2·5 | +10·2 | + 7·3 | Definition poor. |
| | | | | | | *γ Ursæ Majoris.* | | |
| 1879, May | 21 | M. | 4 | F | +12·2 | + 8·2 | + 6·3 | Tremulous. |
| June | 9 | M. | 6 | F | +11·4 | +23·5 | +30·2 | |
| 1880. Apr. | 8 | M. | 6 | F | + 9·7 | +20·0 | +18·4 | |
| May | 22 | M. | 2 | F | +12·2 | + 4·3 | + 2·2 | Definition poor. Faint. |
| June | 28 | M. | 6 | F | + 9·4 | + 4·4 | +11·8 | Definition fair. |

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| Date. | Obser-ver. | Weight. | Line. | Earth's motion in miles per sec. | Concluded motion of star. | |  Remarks. |
|---|---|---|---|---|---|---|---|
| | | | | | Measured. | Estd. | |
| | | | *δ Ursæ Majoris.* | | | | |
| 1880, June 28 | M. | 2 | F | + 8·6 | +20·8 | +29·5 | |
| | | | *γ Virginis.* | | | | |
| 1880, Mar. 17 | M. | 4 | F | − 3·5 | +57·4 | +51·0 | Definition fair. |
| May 1 | M. | 2 | F | + 9·8 | +12·6 | +16·5 | |
| 15 | M. | 1 | F | +13·0 | +27·4 | +45·4 | Definition poor. |
| | | | *ε Ursæ Majoris.* | | | | |
| 1879, May 21 | M. | 5 | F | +10·4 | +24·4 | +51·2 | |
| June 9 | M. | 4 | F | +10·2 | + 9·8 | +14·8 | |
| 1880, May 22 | M. | 4 | F | +10·4 | + 0·2 | + 0·4 | Definition poor. |
| June 4 | M. | 8 | F | +10·3 | +15·4 | +20·9 | Definition good. |
| | | | *δ Virginis.* | | | | |
| 1880, Feb. 26 | M. | 1 | $b_4$ | − 9·7 | +62·7 | +51·8 | Definition poor. |
| | | | *α Canum Venaticorum.* | | | | |
| 1880, May 25 | M. | 8 | F | +13·0 | −30·2 | −29·6 | Definition good. |
| | | | *ε Virginis.* | | | | |
| 1880, Feb. 21 | M. | 2 | $b_1$ | −10·4 | −28·9 | −32·0 | |
| 26 | M. | 2 | $b_1$ | − 9·1 | −26·7 | −25·2 | Definition poor. |
| | | | *Spica.* | | | | |
| 1880, May 1 | M. | 6 | F | + 6·1 | + 0·3 | + 1·8 | Tremulous. Definition poor. |
| 15 | M. | 6 | F | + 9·9 | − 5·4 | − 4·1 | Very tremulous. |
| 25 | M. | 4 | F | +12·2 | − 2·2 | − 2·9 | Very tremulous. |
| | | | *ζ Ursæ Majoris.* | | | | |
| 1880, June 4 | M. | 6 | F | + 9·9 | + 7·2 | +11·4 | Definition fair. |
| 28 | M. | 4 | F | + 9·0 | +35·1 | +49·3 | |
| | | | *η Ursæ Majoris.* | | | | |
| 1880, June 4 | M. | 6 | F | +10·2 | +14·2 | +25·2 | Definition good. |
| | | | *Arcturus.* | | | | |
| 1880, May 29 | M. | 7 | $b_1$ | +11·1 | −24·6 | −27·2 | Definition bad. |

| Date. | Observer. | Weight. | Line. | Earth's motion in miles per sec. | Concluded motion of star. Measured. | Concluded motion of star. Estd. | Remarks. |
|---|---|---|---|---|---|---|---|
| | | | | *γ Boötis.* | | | |
| 1880, July 7 | W.C. | 2 | F | +11·6 | −50·5 | −53·2 | |
| | | | | *ε² Boötis.* | | | |
| 1880, Feb. 26 | M. | 4 | $b_1$ | −10·6 | −14·3 | − 8·3 | Definition fair. |
| May 29 | M. | 2 | $b_1$ | + 9·2 | − 1·4 | 0·0 | Definition bad. |
| | | | | *β Ursæ Minoris.* | | | |
| 1880, Feb. 21 | M. | 5 | $b_1$ | + 2·0 | +24·0 | +19·7 | Tremulous. Definition poor. |
| Sept. 13 | M. | 3 | $b_1$ | + 3·9 | +32·6 | +31·6 | Definition poor. |
| | | | | *β Libræ.* | | | |
| 1880, May 8 | M. | 12 | F | + 0·3 | + 7·4 | + 7·6 | Definition good. |
| 18 | M. | 4 | F | + 3·3 | +12·4 | +10·6 | Tremulous. Definition poor. |
| July 13 | W.C. | 2 | F | +15·8 | +35·0 | +31·0 | Hazy. Spectrum tremulous. |
| | | | | *α Coronæ.* | | | |
| 1879, Sept. 3 | M. | 2 | F | +11·2 | +22·9 | +22·0 | |
| 1880, May 18 | M. | 6 | F | + 3·9 | +10·3 | + 8·5 | Definition poor. |
| | | | | *α Serpentis.* | | | |
| 1880, Feb. 26 | M. | 3 | $b_4$ | −16·1 | −30·5 | −19·3 | |
| | | | | *ε Serpentis.* | | | |
| 1880, May 8 | M. | 6 | F | − 1·0 | +44·5 | +40·3 | Definition good. |
| 18 | M. | 4 | F | + 0·8 | +25·8 | +19·8 | Definition poor. |
| | | | | *γ Herculis.* | | | |
| 1880, May 15 | M. | 1 | F | − 0·5 | −52·8 | −82·3 | Faint, but definition fair. |
| 25 | M. | 1 | F | + 1·8 | + 7·8 | + 7·5 | Definition bad. Very doubtful. |
| | | | | *η Draconis.* | | | |
| 1880, Sept. 13 | M. | 1 | $b_1$ | + 1·3 | +21·4 | +20·4 | Tremulous. Definition poor. |
| 20 | M. | 4 | $b_1$ | + 0·9 | −27·2 | −35·2 | Definition fair. |
| 29 | M. | $3\frac{1}{2}$ | $b_1$ | − 0·3 | +36·1 | +39·2 | Tremulous. |

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| Date. | | Obser-ver. | Weight. | Line. | Earth's motion in miles per sec. | Concluded motion of star. | | Remarks. |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Measured. | Estd. | |
| | | | | | | *β Herculis.* | | |
| 1879, July | 23 | M. | 1½ | $b_1$ | +11·5 | +42·9 | +41·6 | Observation doubtful. |
| | | | | | | *ζ Herculis.* | | |
| 1879, Aug. | 22 | M. | 3 | $b_1$ | +10·7 | +41·6 | +30·2 | Interrupted by cloud. |
| | 25 | M. | 4 | $b_1$ | +10·7 | +18·0 | +15·7 | |
| | | | | | | *ζ Draconis.* | | |
| 1882, Oct. | 1 | M. | 2 | F | + 1·5 | −23·7 | −27·0 | Faint but steady. |
| Nov. | 8 | M. | 3 | F | + 1·2 | −20·5 | −18·6 | Faint but steady. |
| | | | | | | *β Draconis.* | | |
| 1880, Sept. | 13 | M. | 2 | $b_1$ | + 4·5 | +40·5 | +32·2 | Tremulous. Definition poor. |
| | 27 | M. | 6 | $b_1$ | + 4·2 | +16·0 | +18·7 | Mist. Faint but steady. |
| | | | | | | *α Ophiuchi.* | | |
| 880, July | 15 | M. | 4 | F | + 7·9 | −21·5 | −19·6 | Definition fair. |
| | 29 | M. | 6 | F | +10·5 | +14·9 | +16·1 | Definition fair. |
| Sept. | 3 | M. | 1 | F | +14·5 | +25·7 | +24·2 | Definition bad. |
| | | | | | | *ξ Draconis.* | | |
| 1880, Sept. | 27 | M. | 1 | $b_1$ | + 3·0 | + 8·3 | +11·0 | Observation doubtful. |
| | | | | | | *γ Draconis.* | | |
| 1880, Sept. | 13 | M. | 4 | $b_1$ | + 4·7 | −11·0 | −11·4 | Definition fair. |
| | | | | | | *α Lyræ.* | | |
| 1880, July | 29 | M. | 8 | F | + 3·4 | −23·7 | −25·2 | Definition fair. |
| | 29 | M. | 8 | F | + 3·4 | −15·8 | −11·7 | Two-prism train. |
| Sept. | 3 | M. | 6 | F | + 7·3 | −26·4 | −28·2 | Tremulous. Definition bad. |
| Nov. | 27 | M. | 12 | F | + 5·5 | −33·1 | −40·0 | |
| | | | | | | *γ Lyræ.* | | |
| 1879, Sept. | 3 | M. | 8 | F | + 8·0 | + 7·4 | + 6·7 | Steady. |
| 1880, Nov. | 27 | M. | 6 | F | + 7·6 | + 8·6 | +16·3 | |
| | | | | | | *ζ Aquilæ.* | | |
| 1880, July | 15 | M. | 6 | F | + 1·4 | −27·4 | −23·8 | Definition fair. |

| Date. | Obser-ver. | Weight. | Line. | Earth's motion in miles per sec. | Concluded motion of star. | | Remarks. |
|---|---|---|---|---|---|---|---|
| | | | | | Measured. | Estd. | |
| | | | | *δ Aquilæ.* | | | |
| 1880, July 15 | M. | 1 | F | + 0·5 | + 18·7 | + 17·4 | Definition poor. |
| | | | | *β Cygni.* | | | |
| 1879, Aug. 25 | M. | 3 | $b_1$ | + 6·4 | − 31·3 | − 38·5 | Definition fair. |
| 1880, Sept. 20 | M. | 3 | $b_1$ | − 10·2 | − 3·9 | − 1·5 | Interrupted by cloud and mist. |
| Nov. 20 | M. | 4 | $b_1$ | − 10·8 | − 13·1 | − 22·3 | |
| | | | | *γ Aquilæ.* | | | |
| 1879, Sept. 2 | M. | 1 | $b_1$ | + 10·1 | − 49·3 | − 48·5 | Mist. Definition poor. |
| | | | | *δ Cygni.* | | | |
| 1880, July 29 | M. | 2 | F | − 1·0 | − 29·0 | − 27·6 | |
| Sept. 3 | M. | 1 | F | − 3·6 | − 22·8 | − 21·5 | Faint. Definition poor. |
| Nov. 8 | M. | 10 | F | − 8·1 | − 6·0 | − 6·6 | Mist. Faint but steady. |
| | | | | *α Aquilæ.* | | | |
| 1880, July 20 | M. | 12 | F | − 0·4 | − 10·5 | − 13·6 | |
| | | | | *γ Cygni.* | | | |
| 1879, Sept. 3 | M. | 6 | F | + 3·0 | + 8·8 | + 5·3 | |
| 1880, Sept. 29 | M. | 4 | $b_1$ | − 6·9 | − 5·2 | − 6·9 | Faint and tremulous. |
| | | | | *α Delphini.* | | | |
| 1879, Sept. 3 | M. | 2 | F | + 6·5 | + 21·3 | + 19·4 | |
| 1880, July 20 | M. | 1 | F | − 4·4 | + 25·3 | + 24·3 | Faint. Definition poor. |
| | | | | *α Cygni.* | | | |
| 1880, Sept. 29 | M. | 4 | $b_1$ | + 5·1 | − 18·4 | − 20·5 | Tremulous. Definition poor. |
| | | | | *ε Cygni.* | | | |
| 1878, Oct. 22 | M. | 5 | $b_1$ | + 10·8 | + 14·8 | + 17·4 | Tremulous. |
| | | | | *ζ Cygni.* | | | |
| 1880, Nov. 20 | M. | 1 | $b_1$ | − 13·0 | − 6·7 | − 18·8 | Definition poor. |

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| Date. | Observer. | Weight. | Line. | Earth's motion in miles per sec. | Concluded motion of star. Measured. | Estd. | Remarks. |
|---|---|---|---|---|---|---|---|
| | | | | | *α Cephei.* | | |
| 1880, Nov. 21 | W.C. | 2 | F | + 5·1 | −75·9 | −48·6 | |
| | | | | | *$\beta^2$ Cephei.* | | |
| 1880, Nov. 20 | M. | 3 | $b_1$ | − 2·7 | +53·1 | +53·8 | Spectrum faint. |
| | | | | | *ε Pegasi.* | | |
| 1878, Sept. 18 | M. | 2 | $b_4$ | + 7·2 | −15·7 | −14·6 | Definition poor. |
| Oct. 22 | M. | 5 | $b_1$ | +14·8 | −20·8 | −20·5 | Definition fair. |
| 25 | W.C. | 2 | $b_1$ | +15·2 | −23·5 | −21·6 | Two-prism train. |
| Nov. 2 | W.C. | 2 | $b_1$ | +16·3 | + 0·2 | − 4·8 | Two-prism train. |
| 2 | M. | 1½ | $b_1$ | +16·3 | −24·9 | −23·5 | Two-prism train. |
| 1879, Aug. 25 | M. | 6 | $b_1$ | + 0·6 | + 7·3 | +14·2 | Definition fair. |
| 1880, Sept. 29 | M. | 2 | $b_1$ | −10·2 | −17·2 | −19·0 | Faint and tremulous. |
| | | | | | *η Pegasi.* | | |
| 1879, Aug. 25 | M. | 4 | $b_1$ | − 5·4 | −23·7 | −23·5 | Definition bad. |
| 1880, Sept. 27 | M. | 1 | $b_1$ | + 2·9 | −10·3 | −11·4 | Faint. Doubtful. |
| | | | | | *β Pegasi.* | | |
| 1880, Sept. 27 | M. | 2 | $b_4$ | + 2·1 | +21·7 | +23·2 | Definition fair. |
| 27 | M. | 2 | $b_1$ | + 2·1 | + 8·6 | +10·6 | |
| | | | | | *α Pegasi.* | | |
| 1880, Sept. 3 | M. | 2 | F | − 2·9 | −21·5 | −20·9 | Definition bad. |
| Nov. 25 | W.C. | 3 | F | +17·0 | −77·1 | −51·4 | |
| 27 | M. | 13 | F | +17·2 | −39·9 | −50·0 | |

The following table gives the mean results of all the observations of star motions at Greenwich compared with the results obtained by Dr. Huggins. The probable errors of the Greenwich results, inferred from the separate discordances, are appended with the sign ±, in cases where there were sufficient observations to give a rough estimate of the probable error. The character of the line measured is given in the remarks, as on this depends very largely the accuracy of the observations.

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*Motions of Stars in the Line of Sight in Miles per Second.*

+ denotes recession; − denotes approach. The weights are on a scale ½ to 5 for each observation.

| Star's Name. | Concluded Motion. | Weight. | No. of Nights. | Dr. Huggins' Results. | Remarks. |
|---|---|---|---|---|---|
| α Andromedæ | −33 ± 4·2 | 28 | 9 | − | F broad; nebulous. |
| β Cassiopeiæ | +? | 7 | 1 | | F broad; diffused. |
| γ Pegasi | −46 | 18 | 3 | −? | F diffused. |
| α Cassiopeiæ | +? | 9 | 2 | | $b_1$ |
| γ Cassiopeiæ | −27 | 12 | 2 | + | F bright; nebulous. |
| β Andromedæ | +12 | 18 | 2 | | $b_1$ distinct. |
| β Arietis | −14 | 11 | 2 | | F broad; v. dark. |
| α Piscium | −36 | 7½ | 2 | | F narrow; sharp. |
| $\gamma^1$ Andromedæ | −? | 10 | 2 | | $b_1$ |
| α Arietis | −21 | 11 | 4 | | $b_1$ distinct. |
| α Ceti | −34? | 4 | 1 | | $b_1$, $b_4$; fluted spectrum. |
| β Persei | − | 3 | 1 | | F v. dark; sharp. |
| α Persei | +25 | 7 | 2 | | F faint; diffused. |
| ζ Persei | − | 1 | 1 | | $b_1$ v. faint. |
| Aldebaran | +20 ± 2·0 | 26½ | 7 | +? | $b_1$ v. distinct. |
| Capella | +27 ± 4·5 | 53 | 9 | + | $b_1$ distinct; F sharp. |
| Rigel | +18 ± 1·9 | 40½ | 9 | +15 | F v. distinct. |
| γ Orionis | − 1 ± 1·4 | 25 | 4 | | F v. distinct. |
| β Tauri | −18 | 17 | 3 | | F broad; diffused. |
| δ Orionis | + 4 ± 6·1 | 11½ | 6 | | F faint; narrow. |
| ε Orionis | −22 ± 10·3 | 23 | 6 | | F faint; narrow. |
| ζ Orionis | + 9 | 7 | 3 | | F faint; narrow. |
| κ Orionis | − 1 | 4 | 2 | | F distinct. |
| α Orionis | +21 ± 1·8 | 54 | 8 | +22 | $b_1$, $b_4$; fluted spectrum. |
| β Aurigæ | − 7 | 12 | 3 | | F v. broad; neb. |
| γ Geminorum | + 2 | 9 | 2 | | F broad; sharp. |
| Sirius | +20 ± 2·4 | 81 | 10 | +18 to 22 | F v. broad; diffused. |
| β Canis Minoris | −? | 3 | 1 | | F broad; diffused. |
| Castor | +25 ± 4·2 | 34 | 8 | +23 to 28 | F v. broad; diffused. |
| Procyon | +24 ± 3·9 | 65 | 10 | + | F broad; nebulous. |
| Pollux | −26 ± 4·0 | 74 | 13 | −49 | $b_1$ dist. F faint; sharp. |
| α Hydræ | +39 | 7½ | 2 | | $b_1$ |
| ε Leonis | −14 | 8 | 3 | | $b_1$ distinct. |
| Regulus | +26 ± 2·4 | 48 | 8 | +12 to 17 | F broad. |

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| Star's Name. | Concluded Motion. | Weight. | No. of Nights. | Dr. Huggins' Results. | Remarks. |
|---|---|---|---|---|---|
| $\gamma^1$ Leonis | −38 ± 4·6 | 25 | 5 | − | $b_1$ |
| β Ursæ Majoris | +28 ± 4·7 | 34 | 8 | +17 to 21 | F v. dark; brd.; neb. |
| α Ursæ Majoris | −27 | 6 | 2 | −46 to 60 | $b_1$; F faint. |
| δ Leonis | −28 | 14 | 2 | + | F broad; dark. |
| θ Leonis | + ? | 2 | 1 | | F v. dark; brd.; diff. |
| χ Ursæ Majoris | + ? | 1 | 1 | | F v. dark; brd.; neb. |
| β Leonis | +34 | 18 | 4 | + | F broad. |
| γ Ursæ Majoris | +17 ± 2·7 | 30 | 6 | +17 to 21 | F v. dark; brd.; neb. |
| δ Ursæ Majoris | +10 | 6 | 2 | +17 to 21 | F v. dark; brd.; neb. |
| γ Virginis | +37 | 10 | 4 | | F faint; diffused. |
| ε Ursæ Majoris | +16 ± 3·7 | 27 | 5 | +17 to 21 | F broad; diffused. |
| δ Virginis | + ? | 1 | 1 | | $b_4$; fluted spectrum. |
| α Canum Venat. | − ? | 8 | 1 | | F v. dark; broad; [sharp. |
| ε Virginis | −28 | 4 | 2 | | $b_1$ |
| Spica | + 4 ± 4·0 | 36 | 7 | + | F narrow; sharp. |
| ζ Ursæ Majoris | +18 | 16 | 3 | +17 to 21 | F v. dark; brd; neb. |
| η Ursæ Majoris | − 8 | 13 | 3 | + | F broad; diffused. |
| η Boötis | − ? | 4 | 1 | | $b_1$ distinct. |
| Arcturus | −33 ± 2·8 | 110 | 14 | −55 | $b_1$ v. distinct; $D_2$ dark; [F sharp. |
| γ Boötis | − ? | 2 | 1 | | F broad. |
| $\epsilon^2$ Boötis | − 7 ± 3·6 | 36 | 7 | − | $b_1$, $b_4$ distinct. |
| β Ursæ Minoris | +26 | 8 | 2 | | $b_1$ faint. |
| β Libræ | +11 | 18 | 3 | | F faint; sharp. |
| α Coronæ | +40 ± 4·6 | 35 | 7 | + | F v. dark; brd; diff. |
| α Serpentis | − ? | 3 | 1 | | $b_4$; fluted spectrum. |
| ε Serpentis | +35 | 10 | 2 | | F broad. |
| γ Herculis | − ? | 2 | 2 | | F diffused. |
| η Draconis | +3 | 8½ | 3 | | $b_1$ v. faint. |
| β Herculis | − ? | 4½ | 2 | | $b_1$ v. faint. |
| ζ Herculis | +25 | 7 | 2 | | $b_1$ |
| ζ Draconis | −22 | 5 | 2 | | F diffused. |
| α Herculis | −31 | 5½ | 2 | | $b_4$ fluted spectrum. |
| β Draconis | +20 | 9½ | 4 | | $b_1$, $b_4$ v. faint. |
| α Ophiuchi | +17? ± 7·1 | 38 | 9 | | F v. diffused. |
| ξ Draconis | + ? | 1 | 1 | | $b_1$ v. faint. |
| γ Draconis | −17 ± 2·0 | 18½ | 5 | | $b_1$, $b_4$ v. distinct. |
| α Lyræ | −34 ± 2·4 | 126 | 14 | −44 to 54 | F v. dark; brd.; diff. |

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| Star's Name. | Concluded Motion. | Weight. | No. of Nights. | Dr. Huggins' Results. | Remarks. |
|---|---|---|---|---|---|
| γ Lyræ | + 9 | 14 | 2 | | F broad; diffused. |
| ζ Aquilæ | – 16? ± 16·5 | 27½ | 5 | | F v. broad; diffused. |
| δ Aquilæ | – ? | 1 | 1 | | F broad. |
| β Cygni | – 18 | 10 | 3 | | $b_1$ distinct. |
| γ Aquilæ | – 14 | 7 | 3 | | $b_1$ distinct. |
| δ Cygni | – 17 ± 3·6 | 25 | 5 | | F diffused. |
| α Aquilæ | – 13? ± 11·8 | 21 | 9 | | F v. broad; diffused. |
| γ Cygni | – 15 ± 3·4 | 37 | 9 | – | $b_1$, $b_4$ dist.; F sharp. |
| α Delphini | + 22 | 3 | 2 | | F v. broad. |
| α Cygni | – 43 ± 4·4 | 51 | 9 | – 39 | $b_1$ faint; F sharp. |
| ε Cygni | + 18 | 12½ | 4 | | $b_1$, $b_4$ |
| ζ Cygni | – ? | 1 | 1 | | $b_1$ indistinct. |
| α Cephei | – ? | 2 | 1 | | F v. dark; sharp. |
| β² Cephei | + ? | 3 | 1 | | $b_1$ indistinct. |
| ε Pegasi | – 15 ± 2·5 | 32 | 10 | | $b_1$, $b_2$, $b_4$ distinct. |
| η Pegasi | – 21 | 5 | 2 | | $b_1$ |
| Fomalhaut | ? | 9 | 2 | | F distinct. |
| β Pegasi | + 19 | 14 | 3 | | $b_1$, $b_4$; fluted spectrum. |
| α Pegasi | – 34 ± 5·9 | 34 | 7 | – | F broad; distinct. |

*Royal Observatory, Greenwich,*
1881, *January* 13.

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